IRS Human Capital: Hiring and Attrition of Employees in Compliance Occupations

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Summary
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Introduction

Revenue Agents, Revenue Officers and Tax Compliance Officers (TCOs) make up a large proportion of the IRS compliance workforce. Revenue Officers generally work with taxpayers that are delinquent in paying their tax liability. Revenue Agents and TCOs conduct audits of previously filed tax returns to determine if tax liability was correctly reported. RA and TCO positions, while similar, differ in the complexity of work assigned to them. TCOs were examined in our original study, but they will not be discussed in this paper.

Many Revenue Agents and Revenue Officers are near retirement age. In just under five years, October of 2008, 45% of the currently employed RAs and ROs will be eligible for retirement. In another five years, this percentage climbs to 66%. Thus, the IRS must invest in hiring and training over the next several years in order to maintain staffing in critical areas.

In this paper, we develop a micro model of attrition for both IRS Revenue Agents and IRS Revenue Officers. We use this model to develop forecasts of the number of RAs and ROs that change jobs or leave the IRS under two different scenarios. The first scenario assumes no new employees are hired. The second scenario assumes hiring levels of RAs and ROs that maintain a constant staffing level.

Model and Forecast Methodology

Empirical Model

A standard probit model is used to model employee attrition. This model generates a probability that a given worker will leave their current job within the next year conditional on being in the job in the current year. We use the one-year transition probabilities to generate aggregate predictions of attrition over the next five years in both RA and RO occupations.

Forecast Methodology

The current year forecast of attrition rates is derived by aggregating the predicted probabilities of each employee leaving before time t, denoted as $P_{it.}$ For t = 2004, expected attrition is $A_t = \sum_{\forall i} P_{it}$ for all employees in the respective job at time t-1.

2004 expected attrition is based on the observed characteristics of the employees in 2003. However, to predict attrition between 2004 and 2005, we need to know the characteristics of the employees that will be in the labor pool in 2004. To accomplish this, we "aged" the current employees and recomputed all the variables derived from age and tenure. The expected number of employees exiting at time $t+1$ is then

$$A_{t+1} = \sum_{\forall i} P_{it+1} = \sum_{\forall i} (1 - P_{it}) P_{it+1}$$

for all employees in the respective job at time $t-1$.

In general, the K period ahead forecast of attrition can be expressed as

$$A_{t+K} = \sum_{\forall i} \left(\left(\prod_{k=0}^{K-1} (1 - P_{it+k}) \right) P_{it+K} \right).$$

Attrition forecasts are generated for two different scenarios. In the first, no additional employees are hired to replace those who leave. Thus, the forecast formula above is applied to the existing employees in 2003.

The second scenario consists of hiring sufficient numbers to maintain the number of employees in a given occupation at the 2003 level. To account for new employees entering the IRS labor force, we identified all new hires during the sample period. We use these individuals as a pseudo pool of potential applicants in the subsequent years. We then randomly "clone" individuals out of this pool to be the new hires in each forecast year. In this scenario, the forecast formulas are applied to the existing workforce and the “clones” that represent the new hires. One problem with this scenario is that the RA and RO occupations have had only limited hiring during the sample period. However, most of the hiring occurred in the more recent years. Thus, we feel that the past hires should be very similar to the qualified applicants that would be in future applicant pools.

Data

Our data comes from IRS payroll data. We obtained annual data from the 20th bi-weekly pay periods of each calendar year during 1997-2003. The payroll data contained an abundance of employment information. During this period, the IRS underwent a substantial reorganization that resulted in many RAs and ROs changing jobs. From 1997 to 2003, the total number of RAs has declined by 18.7% and ROs by 25.3%. Even in years where significant numbers of external hires were made, the additional staff has not kept up with attrition.

Table 1 - RO and RA Staffing Levels and Attrition, 1997-2003

	Year	Employees	Quits	External Hires	Transfers out of the Job Series	Transfer into the Job Series	Percentage Change in Staffing
Revenue Agents	1997	15,028	714	19	196	86	-
	1998	14,223	483	35	196	129	-5.36%
	1999	13,708	498	24	190	145	-3.62%
	2000	13,189	526	460	597	223	-3.79%
	2001	12,730	480	532	232	162	-3.48%
	2002	12,712	556	67	102	104	-0.14%
	2003	12,222	-	-	-	-	-3.85%
Revenue Officers	1997	7,454	343	6	89	40	-
	1998	7,068	267	6	161	72	-5.18%
	1999	6,718	223	6	191	50	-4.95%
	2000	6,360	263	240	373	305	-5.33%
	2001	6,269	282	3	167	56	-1.43%
	2002	5,879	269	20	80	22	-6.22%
	2003	5,571	-	-	-	-	-5.24%

Model Estimates

The probit model parameter estimates for the RA and RO models are reported in the Appendix. For the most part, these estimates are consistent with previous research. In addition, the results of the RA model are similar to the estimates for the RO model.

An interesting finding is that the overall retirement plan dummy variable (FERS) was negative and insignificant. This suggests that there is no difference in quit rates between FERS and CSRS employees who are not retirement eligible. However, the model does indicate that not using annual leave is a good indicator that employees are going to quit. Workers who receive poor performance evaluations and are not receiving awards for performance are also more likely to quit.

Forecast Scenario 1- *Attrition with No Hiring*

As a benchmark, we first examined the extreme case where no new employees are hired. Both the RA and RO forecasts that are reported in Table 2 suggest a modest increase in the attrition rate over time. However, the number of employees leaving each year is actually declining because we assume there is no hiring and therefore the labor force is shrinking. Between 2003 and 2004, the estimated attrition rate for RAs is 5.2% and for ROs, 6.4%. The estimated attrition rate increases through the 2007/2008 year when our estimated attrition figures are 5.7% for RAs and 7.4% for ROs. If this occurs, we expect that by 2008 the number of RAs declines by 24.3% to 9,248 employees and the number of ROs declines by 29.7% to 3,916 employees. The forecasts assume that external labor market conditions and the organizational structure will remain constant. If significant organizational change occurs, especially change that creates new internal job opportunities, on can expect that staffing would decline more rapidly.

Table 2 - Attrition Estimates with No New Hires

	Revenue Agents		Revenue Officers	
Year	Count	Attrition Rate	Count	Attrition Rate
2003	12,222	5.21%	5,571	6.39%
2004	11,585	5.25%	5,215	6.53%
2005	10,977	5.40%	4,874	6.75%
2006	10,383	5.55%	4,546	7.00%
2007	9,808	5.70%	4,227	7.36%
2008	9,248	-	3,916	-

Forecast Scenario 2- *Maintaining the Status Quo*

A more interesting and relevant question is how many new ROs and RAs need to be hired to maintain staffing levels. In this scenario, every employee who leaves is back-filled with a new hire from the external labor market. Thus, we keep the number of ROs and RAs at the 2003 levels. Those workers that were hired externally between 1998 and 2003 are used to proxy the pool of potential applicants. We randomly selected from this pool, with replacement, employees to back-fill.

Table 3 displays our forecast results for both RAs and ROs. Both RA and RO attrition is forecasted to initially rise as the new hires are introduced and then eventually decline. Both models include dummy variables for employees with less than two years of tenure. In the first few years of the simulated hiring, new employees account for a larger percentage of the workforce than they do in later years. As the new employees age beyond the initial two years, attrition rates start to fall.

Table 3 - Attrition Estimates: Hiring to Maintain a Constant Staffing Level

	Revenue Agents		Revenue Officers	
	Target Level = 12,222		Target Level = 5,571	
Year	New Hires	Attrition Rate	New Hires	Attrition Rate
2003	637	5.21%	356	6.39%
2004	653	5.34%	370	6.65%
2005	649	5.31%	385	6.91%
2006	631	5.16%	379	6.80%
2007	613	5.01%	371	6.67%

The results suggest that if all remains constant, the IRS will need to hire between 613 and 653 RAs and between 356 and 385 ROs each year over the next five years in order to maintain staffing. If there were improvements in the external labor market or significant postings of internal jobs, we would expect the attrition numbers to be higher.

While both models include dummy variables for low tenured workers, the magnitudes of the increase are different. The RA estimate is negative, very small, and not statistically significant. The RO estimate is positive, much larger, and is significant at any reasonable level. Thus, newly hired ROs have a higher attrition rate than RAs do. One possible explanation is that ROs come from a broader background in terms of academic and labor market experience. Prior academic and labor market experience may be a much better screening device for RA applicants than for RO applicants. Thus, the RA hiring process may be more likely to produce applicants who are a good match with the job duties.

Conclusions and Direction for Further Research

The model developed here not only provides a tool to forecast staffing levels, it provides some insight into the tenure decision of workers within the IRS.

First, we don't see a mass exodus once employees become eligible for retirement. Rather, only a fraction of retirement eligible RAs and ROs leave the IRS each year. In addition, Revenue Agents appear to have more incentive to continue working. It would be interesting to explore to what degree this decision is being driven by financial issues versus job satisfaction issues.

Second, the difference in retirement plans does affect tenure decisions, but only to a point. The results suggest that there is not a significant difference in attrition between CSRS and FERS employees who are not eligible for any form of retirement. One interpretation of this result is that portable retirement funds are not making IRS compliance staff more mobile. However, the model did show FERS employees are more likely to leave when they are eligible for early retirement or if they have reached the top of their salary scale. In addition, CSRS retirement eligible employees are more likely to leave when they have reached the top of their salary scale. Since CSRS pension payments are related to the highest three years of pay, retirement eligible employees who can receive a pay increase have more incentive to delay retirement.

Revenue Agent and Revenue Officer attrition rates for current employees are forecasted to increase over the next five years. We forecast that by 2008, 24.3% of the current RA staff and 29.7% of the current RO staff will no longer be employed as a RA or a RO. We also found that ROs are more likely to leave their job than RAs, especially in the first years of employment. Thus, as the IRS increases hiring to replace ROs, there will be noticeable increases in attrition rates. For new hires, attrition for RAs is more evenly spread out in the initial years of employment.

This research could be expanded in several ways. Differentiating employees who make internal job changes from those who leave the service could provide forecasts that are more useful. Some variables, like performance evaluations, may have qualitatively different impacts on internal promotion than on quits. Also, including measures of wages would improve the forecast and would provide the ability to forecast attrition with various proposed pay raises. However, more data would be needed to estimate the wage effects with any degree of confidence. Additional years of data, especially with new hires, would also give more confidence about attrition in the early years of employment.